

**TABLE7
VACCINES**

DISEASE/AGENT	IMMUNITYBY NATURAL EXPOSURE	VACCINETYPE	VACCINEEFFICACY (aerosolexposure)	COMMENTS
ANTHRAX	Yes ¹	Human: Cell-free culture filtrate of an avirulent, non-encapsulated, derivative of a bovine isolate designated, V770. Animal: Spore suspension of an avirulent, non-encapsulated live strain.	2 dose efficacy against 200-500 LD ₅₀ in monkeys	Required for Level A Lab : No Laboratory-acquired cases: None reported since the late 1950's at which time the human vaccine was introduced. Immunity: The vaccine is 93% effective against cutaneous anthrax.
BRUCELLOSIS	Yes	Human: No human vaccine available in U.S. Animal: In 1996, RB51, a live attenuated strain of <i>B. abortus</i> replaced the S19 strain which was also a live attenuated vaccine.	Novaccine	Required for Level A Lab: None available Laboratory-acquired cases: It is the most commonly reported bacterial infection acquired in laboratories. One of the largest reported incidence involved 45 cases with 1 death. Protection is based on adherence to BSL-3 precautions. Immunity: Studies in humans demonstrate that immunity is acquired after active infection, both cellular and humoral responses are required.
BOTULISM	No ²	Pentavalent (ABCDE) Toxoid ⁴	3 dose efficacy 100% against 25-250 LD ₅₀ in primates	Required for Level A Lab: No Laboratory-acquired cases: There has been 1 report of laboratory associated botulism. Immunity: In foodborne exposures, immunity does not develop even with severe disease, and its repeated occurrence has been reported.
TULAREMIA	Partial	Live attenuated vaccine	80% protection against 1-10 LD ₅₀	Required for Level A Lab: No Laboratory-acquired cases: Over the past 50 yrs, it has been the third most common bacterial infection acquired in laboratories, mostly among research labs. Immunity: Multiple episodes of re-infection have been documented among vaccinated laboratory personnel and in unimmunized individuals.
PLAGUE	Partial	Suspension of killed (formalin-inactivated) <i>Yersinia pestis</i> .	Has yet to be measured precisely in controlled studies. At least 2 vaccinated persons contracted pneumonic plague following <i>Y. pestis</i> exposure.	Required for Level A Lab: No Laboratory-acquired cases: Few lab-associated cases have been reported; since 1936 only 3 cases of pneumonic plague have been documented. Immunity: Indirect evidence, mainly from the military indicates that the plague vaccine is effective for preventing flea-borne transmission of disease.
SMALLPOX	Yes	Vaccinia (smallpox) vaccine ⁵ (grown in the skin of vaccinated bovine calves)	Vaccine protects against large doses in primates	Required for Level A Lab: No Laboratory-acquired cases: Immunity: If a smallpox sample is handled at the Level A, vaccination within 3 days post-exposure is considered effective in preventing serious infection and death. Vaccinia immune globulin may also be considered, but may compromise post-exposure vaccination efficacy.
VHF	3	None available	Novaccine	Required for Level A Lab: No Laboratory-acquired cases: Skin/mucous membrane exposure to virus-laden material, i.e., blood, cell cultures, body fluid/secretions, has been responsible for most recognized cases among humans. Immunity: To be determined.

¹ Some degree of immunity is conferred following cutaneous anthrax, i.e., the lethal dose is below that required for an immune response.

³ Immunity to Lassa fever infection occurs following infection, but the length of protection is unknown.

⁴ Distributed by the CDC under an investigational new drug (IND) protocol and used to protect high risk laboratory staff actively working with

⁵ Distributed by the CDC.

C. botulinum or the toxins.